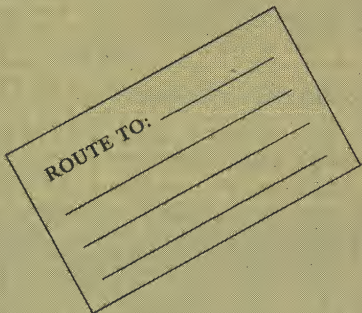

**SCHOOL OF ENGINEERING
AND APPLIED SCIENCE**

**CONTINUING ENGINEERING
EDUCATION PROGRAM**

**APPLICATION of
MODULAR
MICROELECTRONICS
and MICROPROCESSORS**

May 31-June 3, 1977



**THE
GEORGE WASHINGTON
UNIVERSITY**

**WASHINGTON, D.C. 20052
(202) 676-6106
(800) 424-9773**

APPLICATION OF MODULAR MICROELECTRONICS AND MICROPROCESSORS

DESCRIPTION

This course is designed to meet practical needs of systems and application engineers and supervisory-level engineers who are involved with the application of modular microelectronics and microprocessors.

The objective of this course is to provide practical state-of-the-art techniques utilizing microelectronic devices and microprocessors in a modular fashion.

Course participants will gain a knowledge of the latest characteristics and costs of microelectronic devices, the architecture and design of modular microcomputers, and specific applications in telecommunications, data processing, and signal processing.

Although there is no prerequisite for this course, a degree in engineering or computer science would be helpful.

TOPICAL OUTLINE

First Day

Modular Microelectronics

- State of the art: integrated circuit technology
- Logic families and SSI
- Medium-scale integrated circuits, MSI, registers, counters, multiplexors, decoders, PLAs
- Read-Only memories; mask, prom, and E-Rom
- Random-access memories, static and dynamic Rams
- Other memory chips, CAMS, FIFO's, CCD's.

Second Day

Modular Microprocessors/Microcomputers Design

- I/O methods and I/O interfacing
- Microprocessor architecture
- Microcomputer design
- Sequential logic control vs. microprogram control
- Bit-slice microprocessor
- Signal processing application

Third Day

Microprocessors/Microcomputers

- Currently available microprocessors and microcomputers
- Hardware/software trade-offs
- Description of hardware architecture, programming languages and comparisons of some micro-

computers: Intel 8080, M 6800, IMP 16, TI SBP 0400, Rockwell PPS 8

Fourth Day

Applications of Microprocessors in Telecommunications

- Definition, classes, and applications of distributed processing
- Communication concepts for distributed processing systems; circuits, mediums, protocols, front end computers
- Communication networks; data communication, ring networks
- Case Study; trade-off in using microcomputers vs. large computers

INSTRUCTORS

Abd-elfattah M. Abd-alla, Ph.D., is Associate Professor of Engineering and Applied Science at GWU. Dr. Abd-alla received an M.S. in electrical engineering from Alexandria University, Egypt, in 1963, and a Ph.D. in computer science from the University of Maryland in 1969. He is the author of a number of publications on computer architecture and design, and is co-author, with Arnold C. Meltzer, of *Principles of Digital Computer Design* Vol. I. (Vol. II is in preparation). He has been a consultant on the design of computer systems to government agencies.

John H. Carson is a member of the technical staff of the MITRE Corporation. His present work deals with the study and design of special purpose minicomputer systems. His past experience includes work in conjunction with Lehigh University and Bell Telephone Laboratories dealing with the development of minicomputer controlled test equipment. He is also a Lecturer for the American University in the Center for Technology and Administration.

Terry L. Collins is an electronic engineer in the Communication Sciences Division at the Naval Research Lab. He has done extensive work in design of signal processors with hands-on experience in microprocessors and minicomputers. He earned his Ph.D. in Computer Science from the George Washington University in 1976.

FEE

The fee for the course is \$425. This includes lecture notes and supplies. Make checks and purchase orders payable to GWU, Continuing Engineering Education. Free parking is provided. Participants may delay payment until arrival.

HOUSING AND MEALS

Housing and meals are not provided. However, there is a wide variety of hotels, motels, and restaurants nearby. Information on available accommodations will be sent if requested.

LOCATION AND HOURS

Orientation will be at 8:15 a.m. on the first day; classes will meet from 8:30 a.m. to 4:15 p.m. daily in room 641 of the University Library, 2130 H St., N.W. (corner of 22nd and H), Washington, D.C.

CERTIFICATE

A Certificate of Completion will be issued to those attending the full course.

CONTINUING EDUCATION UNITS (CEU)

Continuing Education Units (2.4) will be awarded for the satisfactory completion of this course. The CEU is a unit of measurement for recording noncredit learning in qualified continuing education programs. It provides a standardized means for business, industry, and government to measure in-service education. A permanent transferable record is maintained.

APPLICATIONS

Tentative registration should be made as soon as practicable. Apply by letter, telephone, or purchase order to Continuing Engineering Education Program, George Washington University, Washington, D.C. 20052, (202) 676-6106 or the toll free number (800) 424-9773.

SPECIAL COURSES

Arrangements can be made to design certain courses to meet the needs of an individual activity for presentation on or off campus.

OTHER COURSES

(Dates subject to change)

No.

IN WASHINGTON, D.C.

- 330 Computerized Antenna Analysis (Apr 11-15)
- 435 Telecommunications (Apr 11-15)
- 310 Microprocessors (Apr 13-15)
- 339 Energy Conservation: Opportunities and Guidelines for Existing Buildings (Apr 25-27)
- 426 ECM and ECCM for Digital Communications (Apr 18-22)
- 338 OSHA for Government (Apr 20-22)
- 244B† Temperature Control Systems for Heating and Air Conditioning: Basics of Design (Apr 23-Jun 18)

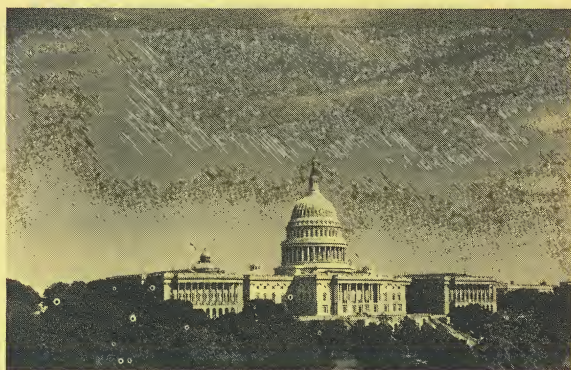
- 241 Modern Data Communications (Apr 25-29)
 167 Forecasting Techniques (Apr 25-29)
 82 Metal Fracture & Fatigue (Apr 25-29)
 298 Numerical Methods in Structural Mechanics
 (Apr 26-29)
 439 Standards, Specifications, Codes and Technical Data
 (Apr 27-29)
 224 Design-to-Cost (May 2-4)
 446 Applied Statistical Theory (May 2-6)
 322 Computer Security (May 4-6)
 420 Life Cycle Costing (May 4-6)
 397 Fibrous Composite Structures (May 9-12)
 287 Environmental Law (May 9-13)
 395 Digital Signal Processing (May 9-13)
 336 Advances in Electronics Technology (May 9-13)
 447 Engineering Management (May 9-13)
 424 Application of Modular Microelectronics and
 Microprocessors (May 11-13)
 414 Total Energy and Selective Energy Utility Systems
 (May 16-17)
 203 Radar Systems and Technology (May 16-20)
 394 Mathematical Theory of Reliability (Apr 16-20)
 249 Electromagnetic Wave Propagation for
 Communications System Design (May 16-20)

†Saturday class

CONTINUING ENGINEERING EDUCATION PROGRAM

J.E. Mansfield, *Director*

The Continuing Engineering Education Program is a series of non-credit courses designed to enhance the competence of practicing engineers. The explosive growth of scientific and technological knowledge has made such programs necessary so that engineers and scientists can remain current in their fields. The courses are taught by instructors from industry, government, and universities who are in the forefront of their respective fields. The program is designed to update an engineering or science degree which may be a number of years old; to provide basic review courses; and to provide the very latest information in the engineering, scientific, and engineering administration fields. A by-product of the program has been the beneficial associations developed among the students and between students and the staff. Although most courses presume a bachelor's degree, nondegree engineers will find the courses understandable and useful.



UNIVERSITY POLICY ON EQUAL OPPORTUNITY

In accordance with the stated policy of its Board of Trustees and in conformity with federal laws and regulations, George Washington University does not discriminate against any person on the bases of sex, race, color, religion, or national origin in any of its education or employment programs or activities. Federal regulations implementing Title IX of the Education Amendments of 1972 call for an explicit statement that the requirement not to discriminate on the basis of sex extends to employment in and admission to such programs and activities.

Inquiries concerning the application of this policy and federal laws and regulations concerning discrimination in education or employment programs and activities may be addressed to the Office of the University's Coordinator of Equal Opportunity Programs or to the Director of the Office of Civil Rights of the Department of Health, Education and Welfare.

APPLICATION OF MODULAR MICROELECTRONICS AND MICROPROCESSORS

May 31-June 3, 1977

registration form

Name			
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<input type="checkbox"/> Register me for course No. _____ <input type="checkbox"/> Payment Enclosed <input type="checkbox"/> Bill Me <input type="checkbox"/> Bill Office <input type="checkbox"/> Please send information on courses numbered: _____			

DETACH ENTIRE PANEL AND MAIL TO:

Continuing Engineering Education, The George Washington University, Washington, D.C. 20052

Please Note: We occasionally mail to selected lists which cannot be cross-checked against our files. Therefore, you may receive a duplicate of this announcement. If so, we hope you will pass it along to an interested associate.

Please Return Entire Panel

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George Washington University
Washington, D.C. 20052

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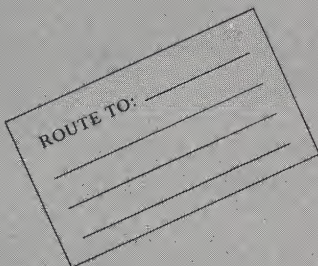
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SCHOOL OF ENGINEERING
AND APPLIED SCIENCE

CONTINUING ENGINEERING
EDUCATION PROGRAM

COMPUTER SECURITY

May 4-6, 1977



THE
GEORGE WASHINGTON
UNIVERSITY

WASHINGTON, D.C. 20052
(202) 676-6106
(800) 424-9773

Course No. 322
COMPUTER SECURITY

DESCRIPTION

This interdisciplinary course is designed to provide both technical and nontechnical personnel with a better understanding of the legal and technological issues, problems, and possible solutions in computer data security. While some discussion of legal issues will be presented, the principal focus of the course will be upon technology.

We are in the midst of fast-breaking developments in several areas related to computer data security. The privacy issue is again before Congress, as well as before various state legislatures, and the Privacy Protection Study Commission has been holding hearings. Computer communications are becoming more sophisticated and widespread, with IBM's entry into satellite communications and an increasing number of computer networks being established. On the technological side, data encryption techniques and federal data security guidelines have been announced, while private industry continues to seek cost-effective data security practices.

The course will include a brief discussion of the historical evolution of the concept of privacy, followed by a review of current and proposed state, federal, and foreign legislation. Important regulatory developments will be considered, including activities of the Privacy Protection Study Commission, the Electronic Fund Transfer Commission, the Federal Communications Commission, the National Bureau of Standards, and the Office of Telecommunications Policy.

The presentation will also cover the technological aspects of privacy and data security. Planning and risk analysis will be discussed, as will physical security, systems security, communications security, applications security, administrative controls, and audit techniques.

TOPICAL OUTLINE

Introduction

- Definitions
- Basic concepts

Data Security and the Law

The Right of Privacy

- Historical evolution of the concept
- Privacy Act of 1974
- Proposed H.B. 1984 (Goldwater-Koch Bill)

Computer Communications

- FCC computer inquiry and its aftermath

The Law of Data Security

- The impact of government regulation: potential liability
- Standards of care for protection of data security
- Standards of care in systems design
- Judicial analysis of technological issues

Current Developments and Related Legal Topics

- EFTS and electronic stock transfer: privacy and security in financial affairs
- Computer crime

Data Security and Technology

Planning and Risk Analysis

- Organization for computer security and privacy

- Threats and vulnerability
- Loss exposures
- Countermeasures selection
- Physical Security*
 - Access control
 - Fire protection
 - Environmental protection
 - Backup and recovery
- Systems Security*
 - Theory of access protection
 - Security and integrity flaws
 - Protection of the operating systems
- Communications Security*
 - Remote access
 - Encryption
 - Surveillance and monitoring
- Applications Security*
 - Programming practices
 - Quality assurance
 - Data base security
- Administrative Controls*
 - Personnel practices
 - Security standards and procedures
 - Legal considerations and insurance
- Audit*
 - Systems measurement and surveillance
 - Internal audit
 - External audit

INSTRUCTORS

Dr. Carl Hammer is the director of computer sciences for Sperry-Univac Corporation. He taught at Columbia University and Hunter College in New York, and joined the computer department of the Franklin Institute in Philadelphia in 1951 as a senior staff engineer. In 1955, he was appointed director of the Univac European Computer Center. Dr. Hammer later worked for RCA, where he took charge of the initial design of the Minuteman Communications System and the Simulation Studies for the 480-L Aircom System. In 1963, Dr. Hammer rejoined Sperry-Univac in Washington, D.C. He is a past president of the American Society for Cybernetics and chairman of the board of its Scientific Council, and by appointment of the Executive Office of the President, a member of the National Defense Executive Reserve. He was given the Computer Sciences Man-of-the-Year Award by the Data Processing Management Association in 1973.

Dr. Stanley Winkler is a member of the IBM Systems Center in Gaithersburg, Md. He joined IBM in 1959 and has served in various scientific and managerial positions, most recently as manager of applied technology for the Data Processing Division in Gaithersburg. Dr. Winkler was the program chairman for the 1976 National Computer Conference held in New York City. He is president of the International Council for Computer Communication, a Fellow of the American Association for the Advancement of Science, a senior member of the IEEE, and is an elected member of Sigma Xi, the science honorary society. From 1968 to 1971, Dr. Winkler served in the Executive Office of the President as the director of the Resource Evaluation Division of OEP. He also served as the senior scientist on the IBM Data Security Study.

Peter S. Browne is president of Computer Resource Controls. He was manager of security operations of the GE Information Services Business Division, Rockville, Md. Prior to joining GE, he was responsible for the development of the computer security program at State Farm Mutual Auto Insurance Company. He has dealt with security of computer information as a staff officer in the Air Force. His computer background includes work as a programmer, senior analyst, and systems designer.

GUEST LECTURERS

Dr. Dennis K. Branstad, System and Software Division, Institute for Computer Sciences and Technology, National Bureau of Standards, Gaithersburg, Md., is the computer security project leader for the development of the NBS data encryption algorithm, and has presented papers and lectured on data security technology.

Lee Danner is a staff member of the IBM Systems Center, Gaithersburg, Md., providing consulting services on distributed processing, computer communications, applications, security, and performance in complex computer systems. From 1972 to 1974 he was a member of the IBM Data Security Study Project Office, providing liaison to the MIT study team and serving as technical editor of the six-volume final report, *Data Security and Data Processing*.

Ronald L. Winkler is an attorney with Sutherland, Asbill & Brennan, Washington, D.C. He is assistant secretary-treasurer of the Computer Law Association, and is a member of the AFIPS Special Committee on EFTS. He has co-authored *Liability for Breaches of Computer Data Security—How Courts Consider Standards of Care and Technological Feasibility*, and *Data Security: Technology and the Regulatory Process*. His practice includes both energy and communications law; he is currently working on a research project on EFTS funded by the OTP.

FEE

The fee for the course is \$395. This includes lecture notes and supplies. Make checks and purchase orders payable to GWU, Continuing Engineering Education. Free parking is provided. Participants may delay payment until arrival.

HOUSING AND MEALS

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OTHER COURSES

(Dates subject to change)

No.

IN WASHINGTON, D.C.

- 259 Satellite Communications Systems (Mar 7-11)
- 437 Switched Networks for Data Communications (Mar 7-11)
- 402 Development of Construction Specifications (Mar 8-17)
- 388 Software Design for Data Communications (Mar 9-11)
- 297 Mechanical Reliability (Mar 14-18)
- 261 Minicomputers (Mar 14-18)
- 410 Administration of Safety Functions and Responsibilities (Mar 16-18)
- 401 Computer Architecture in Microprocessing (Mar 21-25)
- 383 Lubrication Technology (Mar 21-25)
- 390 Solar Heating and Cooling — Residential and Commercial Applications (Mar 21-25)
- 438 Lightning Technology (Mar 23-24)
- 442† Electrical Control Systems for Industrial and Commercial Power Systems (Mar 26-May 21)
- 396 Statistical Techniques for Use in Biomedical Studies (Mar 28-30)
- 212 Electronic Display — Technologies and Applications (Mar 28-31)
- 378 Fiber and Integrated Optics (Mar 28-Apr 1)
- 427† Analog Circuit Design Techniques (Apr 2-May 21)
- 409 Airborne Microwave and Millimeter Wave Sensor Systems (Apr 4-8)
- 269* Construction Estimating (Apr 5-May 17)
- 407 Automated Document Storage and Retrieval Systems (Apr 6-8)
- 417 Emergency Out-Patient Services (Apr 6-8)

†Saturday classes

*Evening classes

UNIVERSITY POLICY ON EQUAL OPPORTUNITY

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COMPUTER SECURITY

May 4-6, 1977

Registration form

Name

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Organization

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City

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Company Phone

Home Phone

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